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Metal Ions Cross-Linking of Epoxidized Natural Rubber

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Abstract : The curing of epoxidized natural rubber (ENR) was performed by using metal ions (Ferric chloride, $FeCl_3$). Two different mole% of epoxide were used there are 25 mole% (ENR-25) and 50 mole% (ENR-50) epoxizied natural rubber. The main aim of this work was investigated the influence of metal ions on the coordination reaction of epoxidized natural rubber. Also, cure characteristics and mechanical properties of the rubber compounds were investigated. It was found that the ENR-50 compounds indicated superior modulus and tensile strength than the ENR-25 compounds. This was attributed to higher the cross-linking in the rubber via coordination linkages between the oxidation groups in ENR molecule and $FeCl_3$of metal ions. Various quantities of FeCl3 were also investigated. It is seen that the ENR-25 and 50 mole% compounds with $FeCl_3$ of more than 3 mmol exhibited higher modulus and tensile strength compare to the pure ENR. Furthermore, the FTIR spectra was used to confirm the cross-linked of ENR with $FeCl_3$.

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